(51) International Patent Classification[7]: G06F 9/00

(21) International Application Number: PCT/US00/14942

(22) International Filing Date: 30 May 2000 (30.05.2000)

(25) Filing Language: English

(26) Publication Language: . English

(30) Priority Data:
60/136,670   28 May 1999 (28.05.1999) US
60/139,235   14 June 1999 (14.06.1999) US

(71) Applicant: SENTILLION, INC. [US/US]; 300 Brickstone Square, Andover, MA 01810 (US).

(72) Inventor: SELIGER, Robert; 10 Sanborn Street, Winchester, MA 01890 (US).

(74) Agent: ENGELSON, Gary, S.; Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210 (US).

(84) Designated States (regional): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published:
— *Without international search report and to be republished upon receipt of that report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CONTEXT MANAGEMENT SERVER APPLIANCE
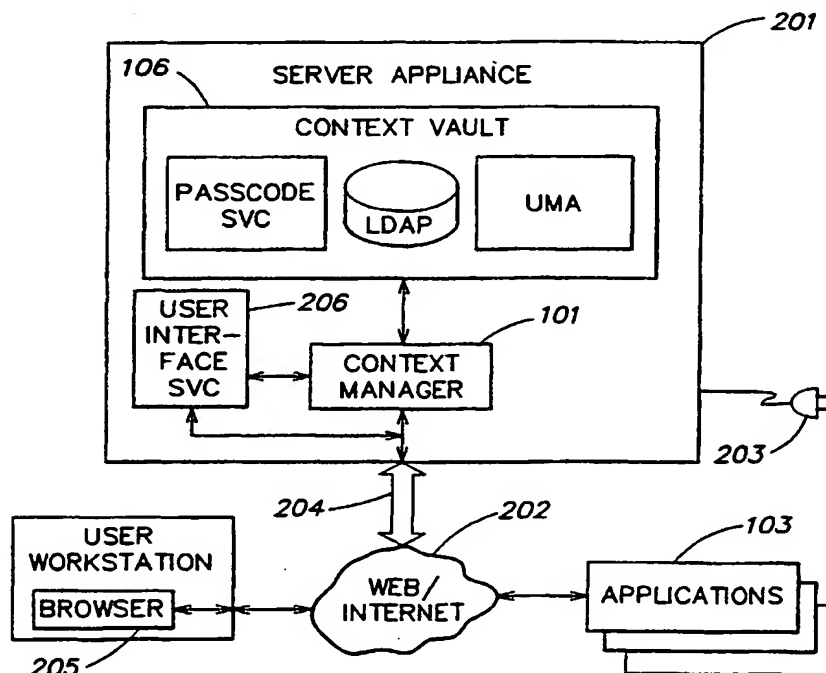
(57) Abstract: Server appliances provide context management functionality in the healthcare field and other fields. The server appliances may present themselves on a network as one or more World Wide Web sites accessible to applications whose context is managed.

In the modern practice of medicine, a physician or other professional or staff member may need to store, retrieve, analyze, etc. various types of patient data. The patient data to be processed may be clinical; e.g. x-ray images or blood work results, or may be financial, e.g. insurance cover and billing history. Thus, clinical applications,

5   such as those to store, retrieve and display x-ray images and those to store, retrieve and display blood work results have inputs and outputs which fall into two broad classes: highly specialized, work product specific I/O; and more general, context-related I/O.

The desirability of managing context information, so that a user at a workstation need not reenter information such as user identification (user ID) or patient identification

10   (patient ID) has long been recognized.

A standard known as Health Level Seven Context Management Specification Version CM-1.1 was promulgated by the Health Level Seven (HL7) Clinical Context Object Workgroup (CCOW) on November 6, 1999, incorporated herein in its entirety by reference, to define an interface and other architectural definitions of a Context

15   Management Architecture (CMA), whereby clinical applications interact with a Context Manager to manage context information across a range of clinical and other health care related applications.

At this time, there is no other known, comprehensive context management software packages available. Some small steps have been taken for example to share

20   context amongst one publisher's own titles, using proprietary methods absent a context manager, or to permit a user to sign onto a single application which transfers user context to plural other applications. However, no context manager handling both user and patient context is known, much less a complete system with central administration of the context management process.

25   A context management administrator is described in detail in U.S. Patent Application Serial No. 09/545,396, referred to above.

Context managers and context management administration software require communication from a user via a user interface. Conventional context managers and context management administrators therefore require a console or monitor and keyboard

30   connected to the computer system on which they execute, in order for the user to communicate therewith. A context management administrator may communicate

- 4 -

The user controls on a server appliance are conventionally very simple. There may be no controls at all, only a power connection and a network connection, as noted above. Alternatively, there may simply be an on/off switch.

5

SUMMARY OF THE INVENTION

The present invention overcomes problems with the conventional approaches to hosting context management and context management administration software by providing, according to various aspects and embodiments thereof, a turnkey system
10   providing context management through a network. Embodiments of the invention can bootstrap themselves into operation after only being connected to a power supply and network.

One embodiment of the invention in a context management server appliance includes a computer system and memory executing a stored set of instruction. The
15   computer system has a power supply input and a network input/output (I/O) port. The memory includes a memory in which is stored a set of instructions defining a context management server which delivers context management information to client applications and a memory in which is stored a set of instructions defining a software interface for administering the context management server over the network using a
20   general-purpose client interface. According to another embodiment of the invention. the context management server appliance further includes a memory in which is stored configuration information for the context management server, whereby the context management server can bootstrap without requiring user intervention. When such an embodiment can bootstrap independently of user intervention, there may also be a
25   memory in which is stored a set of instructions which when executed connect the server appliance to the network absent user intervention. According to another embodiment of the context management server appliance there may be included a memory in which is stored a set of instructions which when executed balance a processing load on the server appliance with a processing load on another server appliance. According to yet another
30   embodiment of the invention, the context management server appliance includes a memory in which is stored a set of instructions which when executed transfers a processing load from a failed server appliance to another server appliance.

When a user performs a relevant application gesture, such as selecting a patient from a list of patients, the application informs the context manager of this fact. The context manager is then responsible for conveying to the other applications that a patient has been selected. Information that identifies the patient is conveyed via the context

5   manager. All of the applications in use then tune their data displays to the selected patient.

In accordance with one aspect of the invention, shown in Fig. 1, the CM resides and executes on a computer, for example web server 102, separate from the application 103 managed. The applications send information to and receive information from the

10   CM through the World Wide Web 104 over the global Internet 105. Communication is effected using conventional protocols such as TCP/IP and HTTP, as needed.

The Web server 102 shown may be distributed over one or more computers providing the functions of the CM 101 and a context vault 106 providing passcode services and a user-mapping agent (UMA). These functions are all described in detail in

15   U.S. Patent Application Serial No. 09/545,396, noted above.

A World Wide Web server provides the only application interface needed for the applications to access the CM and the supporting Context Vaults.

In accordance with another aspect of the invention, as shown in Fig. 2, the context manager 101 resides on the server appliance 201, but tracks and maintains a

20   user's context as established by the user upon a particular computer running an application 103. A single context manager 101 may service one, or several. computers and applications. However, each computer perceives that it is interacting with a single context manager 101.

A network connection 202 between each user's computer and the server appliance

25   enables the necessary communication. The network which the server appliance of Fig. 2 is connected to may be the global Internet. for example. or another wide area or local area network. In addition to the context manager 101, the server appliance 201 may contain additional service modules that support the context manager in performing its tasks. As shown in Fig. 2, the appliance may provide the CM 101 and Context Vault 106

30   functions.

The physical controls for a server appliance are generally limited in nature, and in the simplest case may consist only of an on-off switch. A power connection 203 and a

applications through the network. When a context manager fails or is taken off line for service, the same or a similar service can ensure that context management tasks are suitably redistributed amongst the remaining context management server appliances.

Server appliances embodying aspects of the invention do not merely serve back to the managed applications stored data or simply process input messages. These server appliances perform all of the complex CM functions described in U.S. Patent Application Serial No. 09/545,396, as well as serving the result of that activity to the managed applications.

This invention has been motivated by the application of context management to healthcare. However, context management, and therefore a context management server appliance, can be applied to many industries, and as such this invention is not limited to healthcare.

A network connection between each user's computer and the server appliance, and/or between other general-purpose servers and the server appliance, enables the necessary communication. In addition, the server appliance may contain additional modules that enable the server to be remotely configured and supported.

In the healthcare field, the use of a server appliance for hosting the services relating to maintaining a Master Patient Index, and for hosting services relating to Coding data, is particularly unique.

In general, a Master Patient Index (MPI) implements an application service wherein the myriad of identifiers typically assigned by a healthcare organization to represent each person known to the organization are reconciled. This reconciliation enables the unambiguous correlation of information about a person who is represented by different identifiers in different electronic and paper systems. An MPI typically maintains additional descriptive information about each person. This information, usually referred to as demographics data, includes the person's full name, address, telephone number, etc.

There are currently many MPI software products, each implementing various algorithms for correlating person identifiers. However, these products are all deployed on general-purpose servers. In embodiments of this invention, the MPI is deployed within a server appliance, thereby providing an optimized, cost-effective, easier-to-maintain, information utility for the healthcare enterprise.

invention should therefore not be limited by the foregoing description, but rather by the properly construed claims, which follow.

7.   The server appliance of claim 1, further comprising:

a memory in which is stored a healthcare coding index.

8.   A context management web site accessible through a network, comprising:

a computer memory in which is stored a set of instructions defining a context manager accessible to managed applications through the network; and

a computer memory in which is stored a set of instructions defining a context vault accessible to the context manager.

9.   The context management web site of claim 8, wherein the context vault is accessible to the context manager through the network.

10.   The context management web site of claim 8, further comprising:

a Maser Patient Index server.

11.   The context management web site of claim 8, further comprising:

a healthcare coding index server.
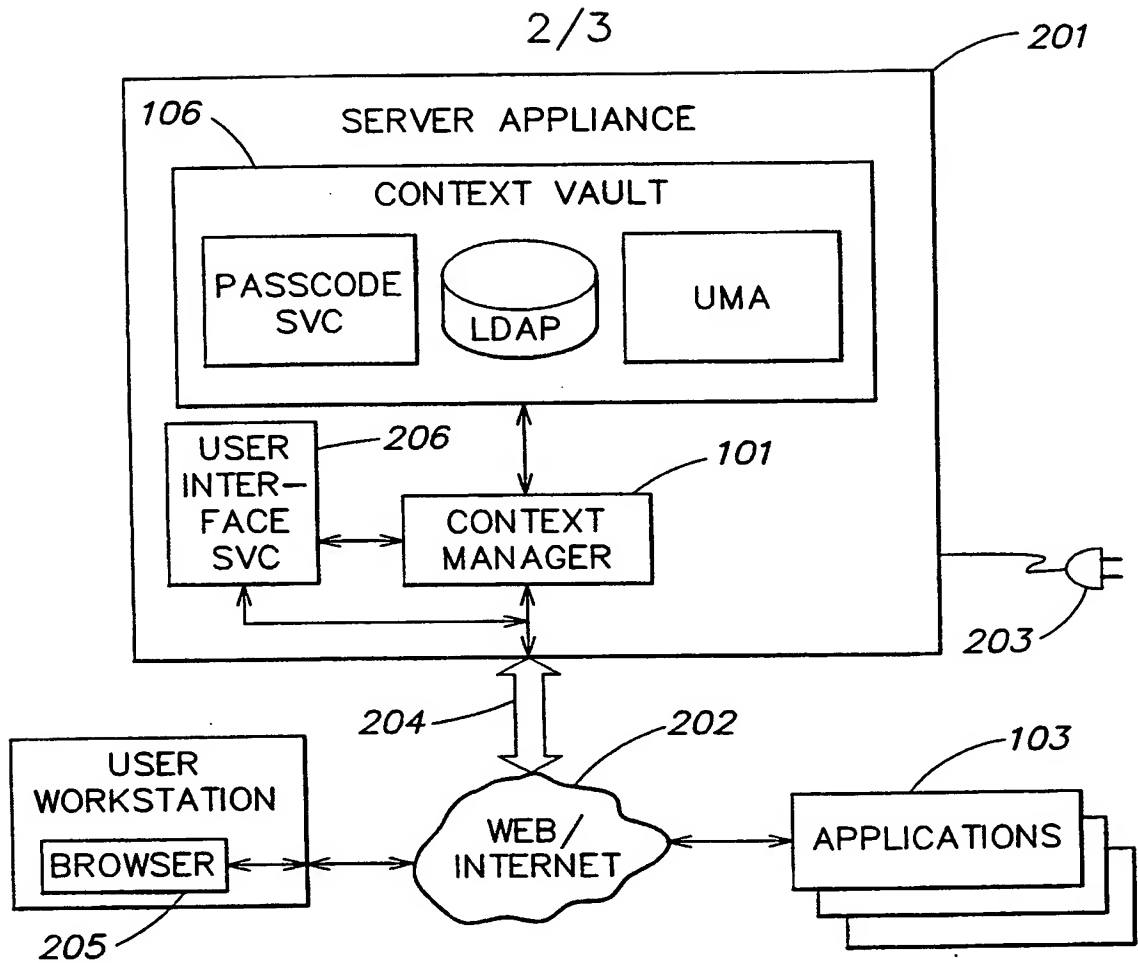
FIG. 2
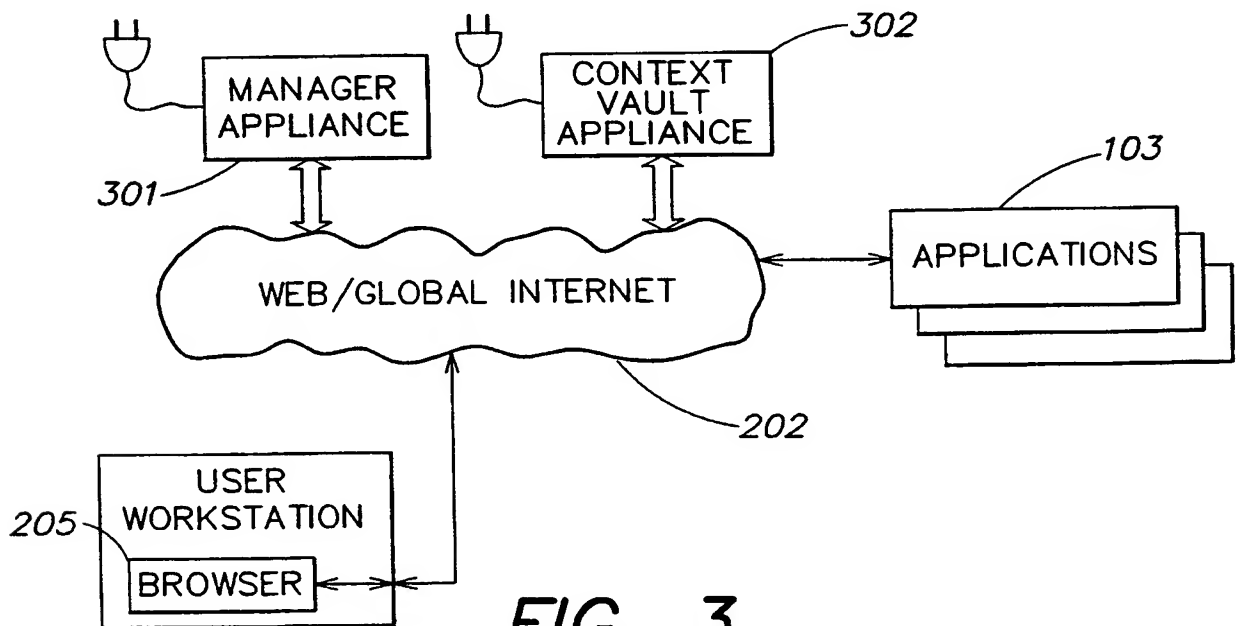
FIG. 3

(51) International Patent Classification⁷: G06F 9/44, 9/46, 11/20

(21) International Application Number: PCT/US00/14942

(22) International Filing Date: 30 May 2000 (30.05.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/136,670   28 May 1999 (28.05.1999)   US
60/139,235   14 June 1999 (14.06.1999)   US

(71) Applicant: SENTILLION, INC. [US/US]; 300 Brick-stone Square, Andover, MA 01810 (US).

(72) Inventor: SELIGER, Robert; 10 Sanborn Street, Winchester, MA 01890 (US).

(74) Agent: ENGELSON, Gary, S.; Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210 (US).

(84) Designated States (regional): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published:
— with international search report

(88) Date of publication of the international search report:
10 May 2002

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
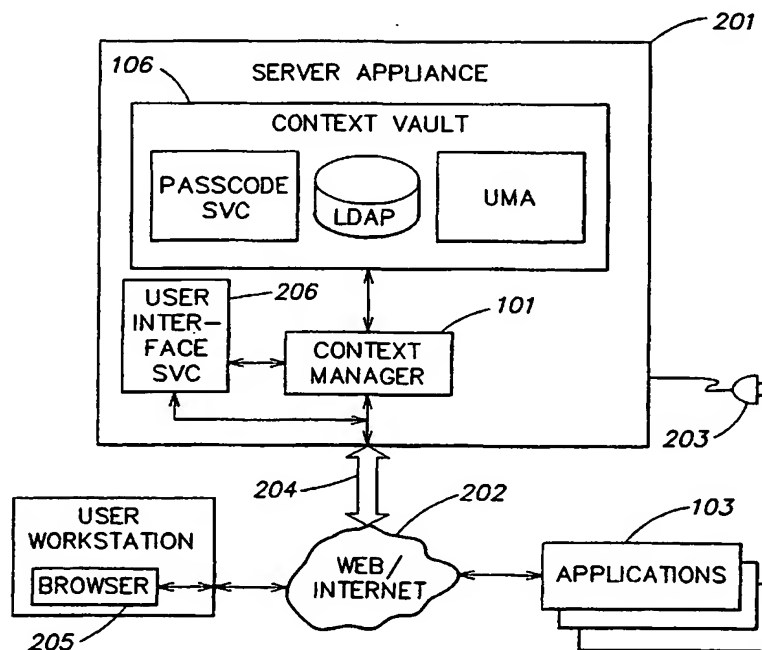
(54) Title: CONTEXT MANAGEMENT SERVER APPLIANCE

(57) Abstract: Server appliances provide context management functionality in the healthcare field and other fields. The server appliances may present themselves on a network as one or more World Wide Web sites accessible to applications whose context is managed.

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 803 808 A (SUN MICROSYSTEMS INC) 29 October 1997 (1997-10-29)	8,9
A	abstract page 2, line 36 - line 55 figures 7,8 ---	1-3
X	GB 2 323 458 A (IBM) 23 September 1998 (1998-09-23) abstract figures 1,2,11 page 1. line 6 - line 12 page 2, line 1 -- line 17 page 3, line 12 - line 19 page 3, line 37 -page 4, line 26 ---	4
X	GB 2 305 747 A (IBM) 16 April 1997 (1997-04-16) abstract figures 1,2 page 1, line 28 - line 36 page 2, line 29 -page 4, line 2 page 5, line 1 - line 28 ---	4
X	EP 0 540 151 A (IBM) 5 May 1993 (1993-05-05) abstract page 3, line 28 - line 30 page 4, line 1 - line 13 ---	4
X	EP 0 459 912 A (FUJITSU LTD) 4 December 1991 (1991-12-04) abstract column 1, line 46 -column 2, line 1 figures 2A,2B,7B,12A,12B, ---	5
X	GB 2 305 087 A (FUJITSU LTD) 26 March 1997 (1997-03-26) abstract figures 2,3,5-7,11 page 1, line 6 - line 10 page 1, line 17 - line 20 page 8, line 9 -page 11, line 18 ---	5
X	WO 95 03580 A (VINCA CORP) 2 February 1995 (1995-02-02) abstract page 4, line 1 -page 7, line 2 figures 1,2 ---	5

-/--

4

INTERNATIONAL SEARCH REPORT

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

     see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest   ☐ The additional search fees were accompanied by the applicant's protest.

                             ☒ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (1)) (July 1998)

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0803808	A	29-10-1997	US 5734831	A	31-03-1998
GB 2323458	A	23-09-1998	US 6078943	A	20-06-2000
			CN 1190213	A	12-08-1998
			JP 3124955	B	15-01-2001
			JP 10254838	A	25-09-1998
GB 2305747	A	16-04-1997	US 5740371	A	14-04-1998
EP 0540151	A	05-05-1993	DE 69227665	D	07-01-1999
			DE 69227665	T	22-07-1999
			JP 2685067	B	03-12-1997
			JP 5216845	A	27-08-1993
			US 5539883	A	23-07-1996
EP 0459912	A	04-12-1991	JP 2781060	B	30-07-1998
			JP 4033154	A	04-02-1992
			JP 2763956	B	11-06-1998
			JP 4047343	A	17-02-1992
			DE 69121973	D	17-10-1996
			DE 69121973	T	30-01-1997
			US 5666479	A	09-09-1997
GB 2305087	A	26-03-1997	JP 9062526	A	07-03-1997
			GB 2344035	A,B	24-05-2000
			US 5802298	A	01-09-1998
WO 9503580	A	02-02-1995	AU 7211594	A	20-02-1995
			US 5812748	A	22-09-1998
			US 5978565	A	02-11-1999
WO 9112583	A	22-08-1991	US 5251294	A	05-10-1993
			AU 7551191	A	03-09-1991